Process to Identify High Priority Corridors for Access Management Near Large Urban Areas in Iowa

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Preface

- This research was funded by the Iowa Department of Transportation Office of Traffic and Safety
- That funding was matched partially through the Midwest Transportation Consortium
- A follow-up project is exploring detailed corridor management techniques on two of the high-ranked corridors identified by this project
  - US 20 west of Dubuque
  - IA 163 east of Des Moines

Presentation Outline

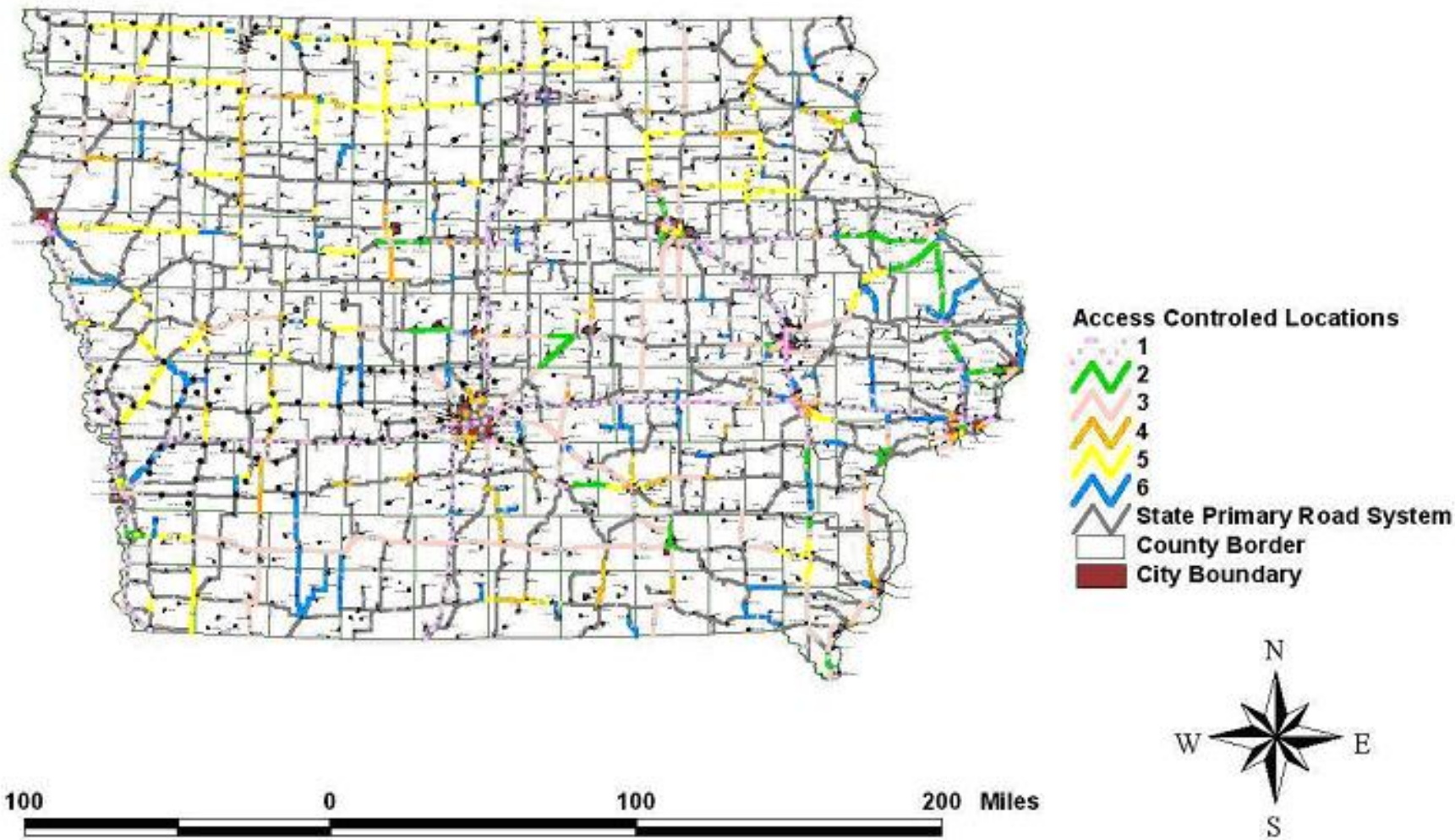
- Current Iowa DOT access classes and map
- Research project goals
- Research methodology
- Key ranking results
- Top ranked potential Improvement corridors
- “Proactive corridor” identification process
- Next steps: thinking about corridor management

Iowa DOT Access Priority Ratings (English Conversion)

Rating	Description
1	Access points at interchanges only
2	Access points spaced at minimum 2625 ft
3	Access points spaced at minimum 984 ft rural, 656 ft urban
4	Access points spaced at minimum 656 ft rural, 328 ft urban
5	Iowa DOT has minimum access rights acquired
6	Iowa DOT has no access rights acquired

Source: Iowa DOT.

State of Iowa: High Priority Access Classifications



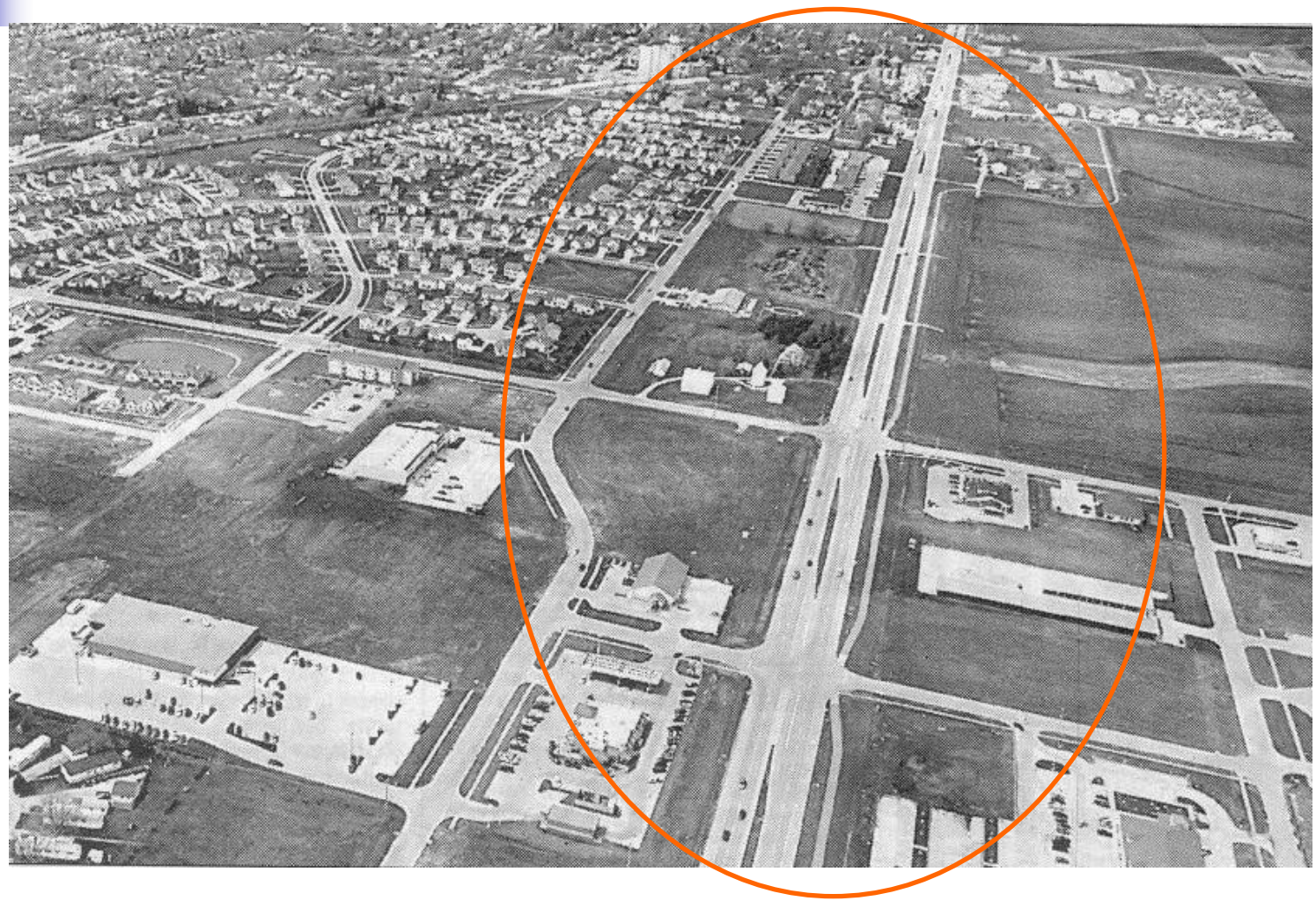
Research Project Goals

- This research project was intended to produce a strategy for addressing current and future access management problems on state highway routes located just outside urban areas that serve as major routes for commuting into and out of major employment centers in Iowa.

- There were two basic goals for the project:
  - Develop a ranking system for identifying high-priority segments for access management treatments on primary highways outside metro and urban areas.
  - Focus efforts on routes that are major commuting routes at present and in the future

- An example commuting corridor: US 6 to the west of the Des Moines metropolitan area

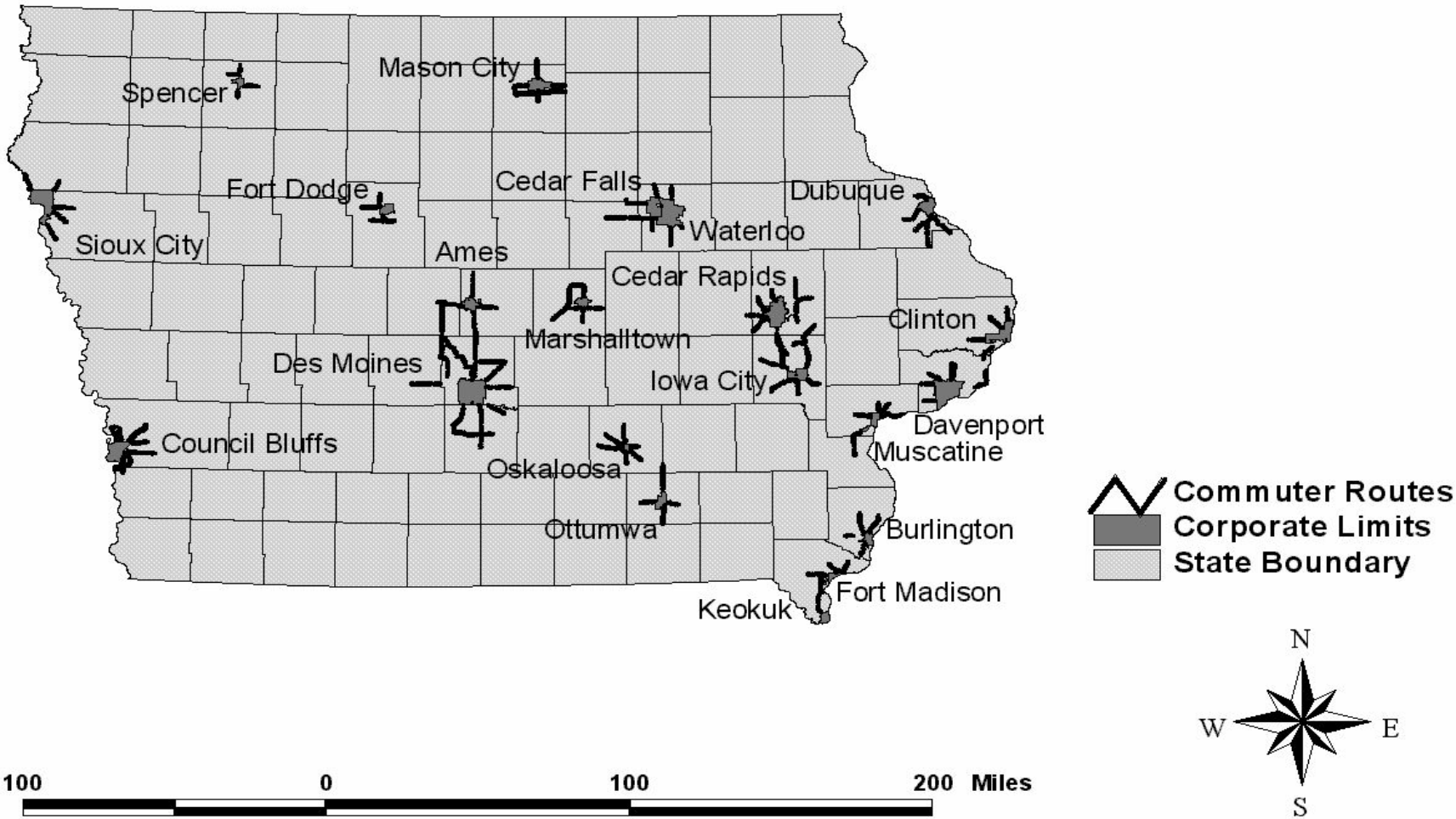
US 6, In The Waukee Area



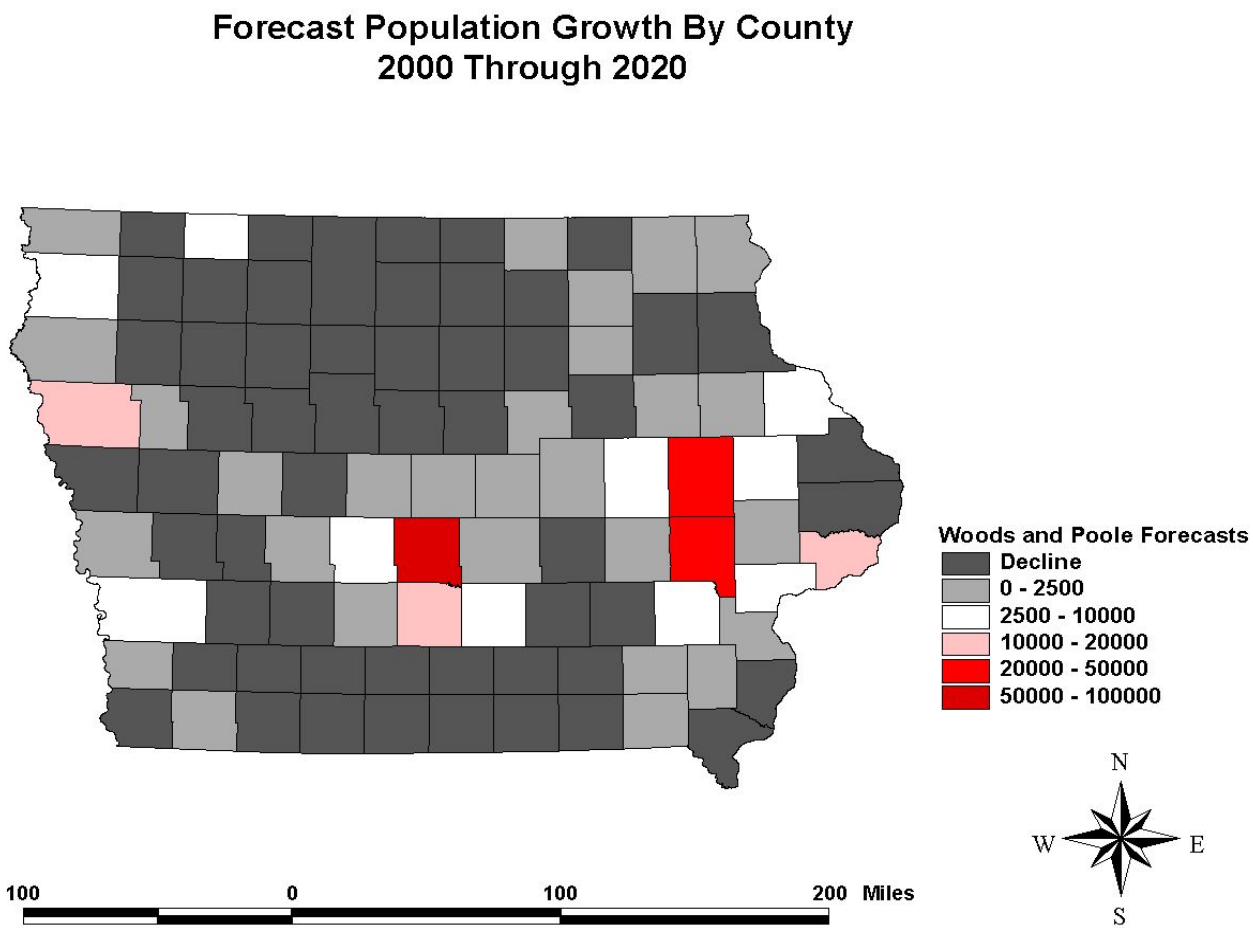
Technologies Used

- A geographic information system (Arc View GIS) was used to integrate various Iowa DOT databases, including roadway characteristics, traffic, and crash records
  - Crash records used were from 1997-1999
- A 2940 zone traffic model was developed using TRANPLAN software to estimate and forecast commuting activity on all Primary routes
  - Known model weakness: border metro areas

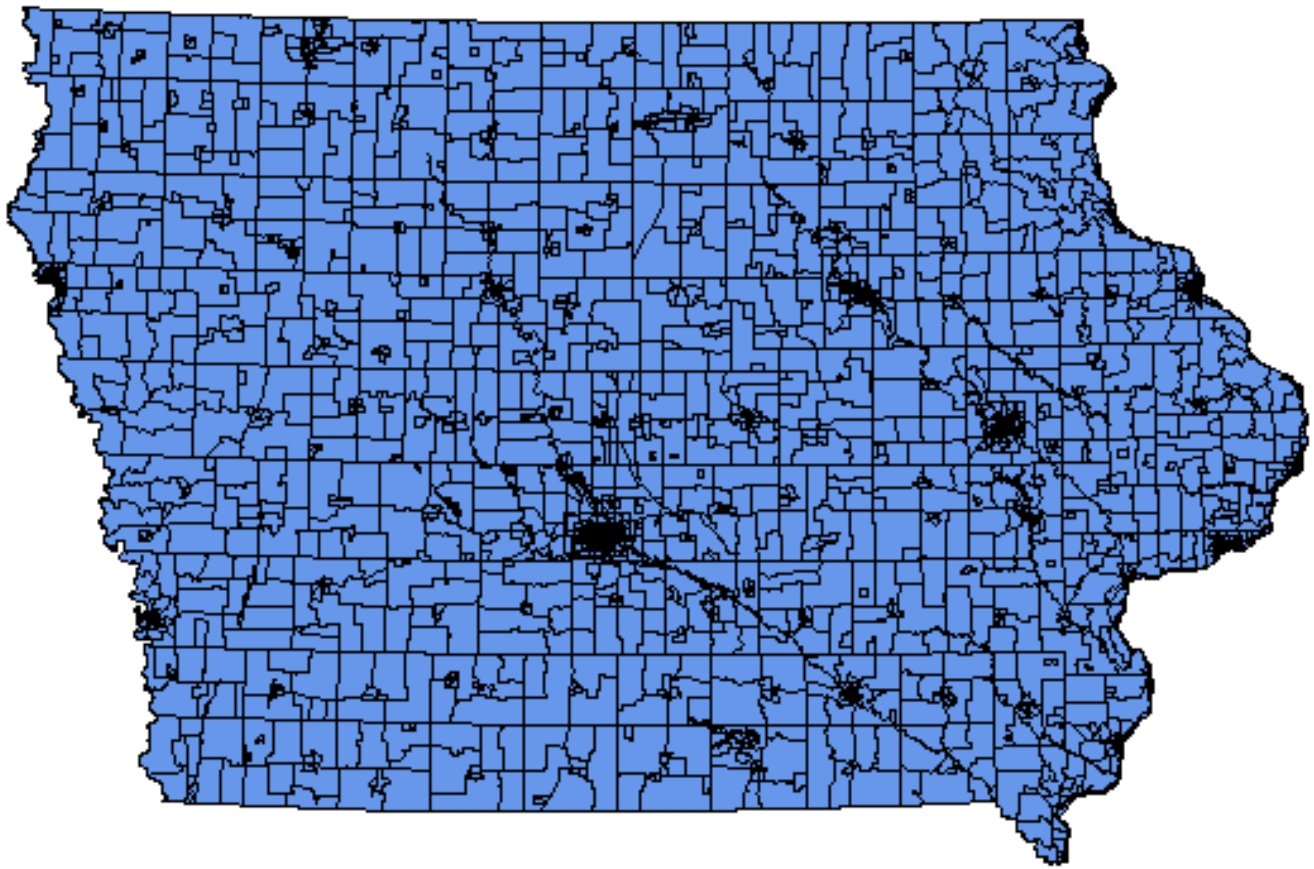
State of Iowa Commuter Routes



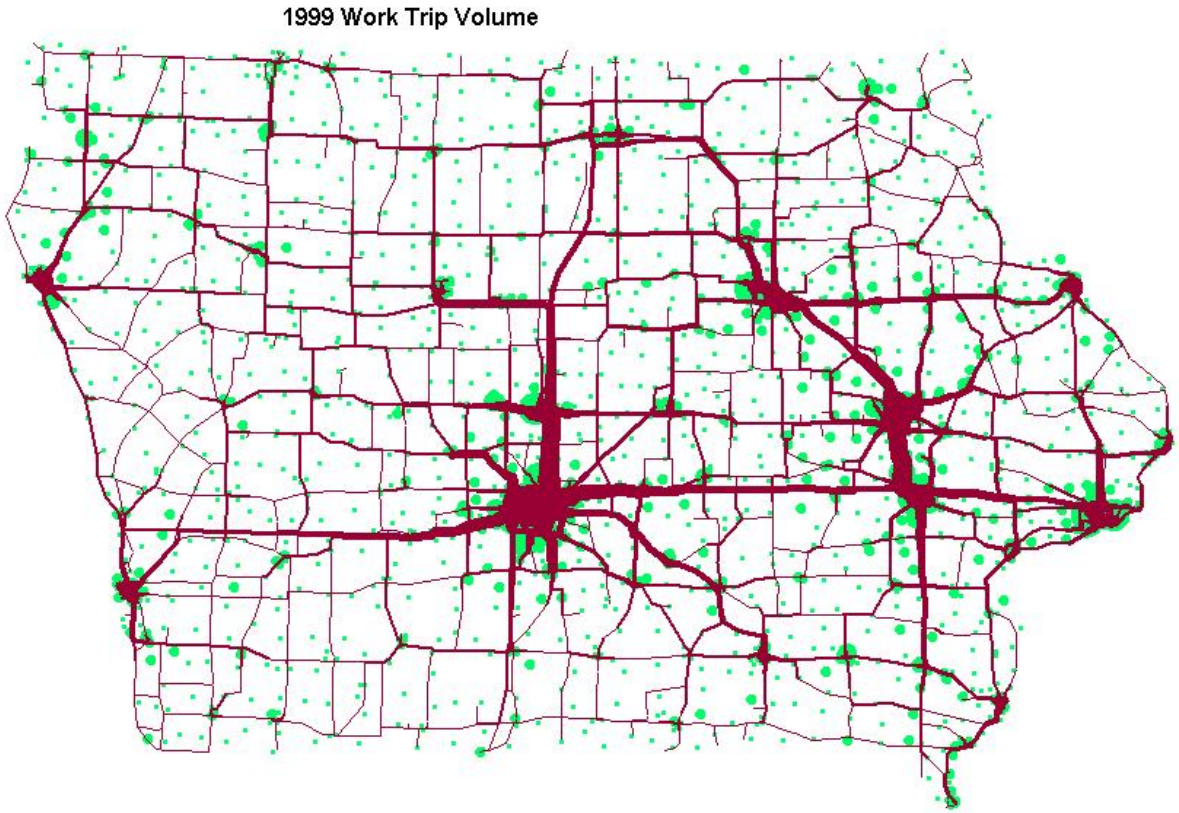
Iowa Forecast Population Growth By County



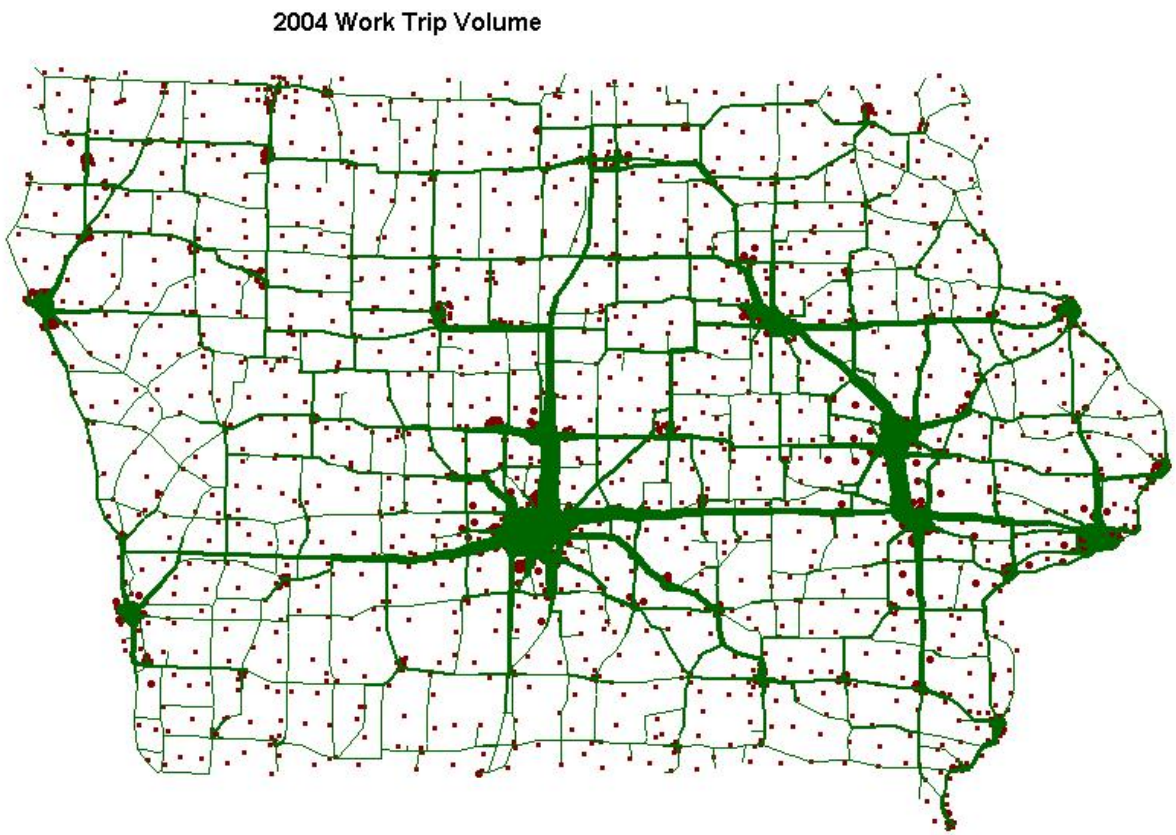
Traffic Model Zone Structure



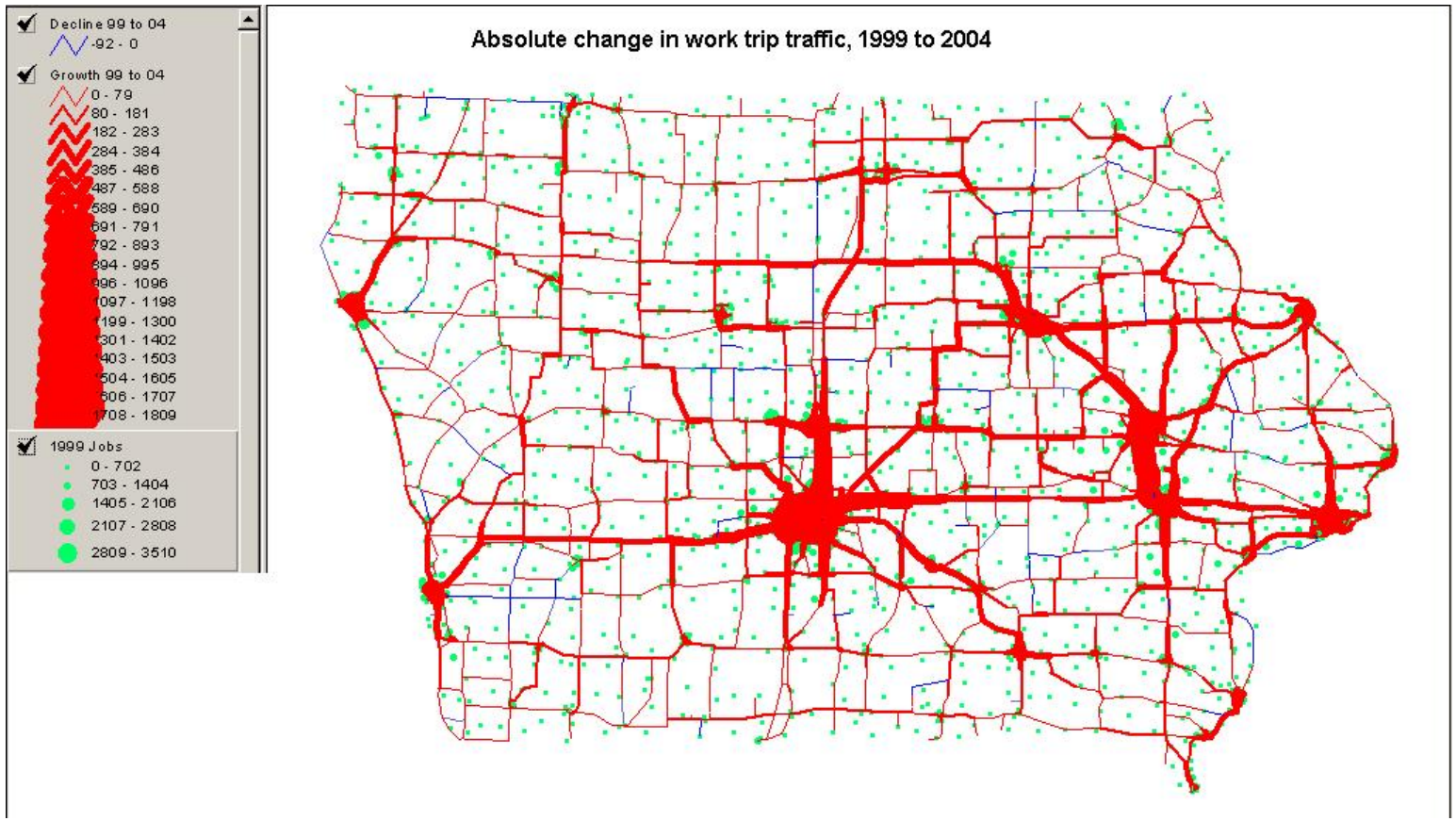
1999 Estimated Traffic Model Commuting Trip Volume



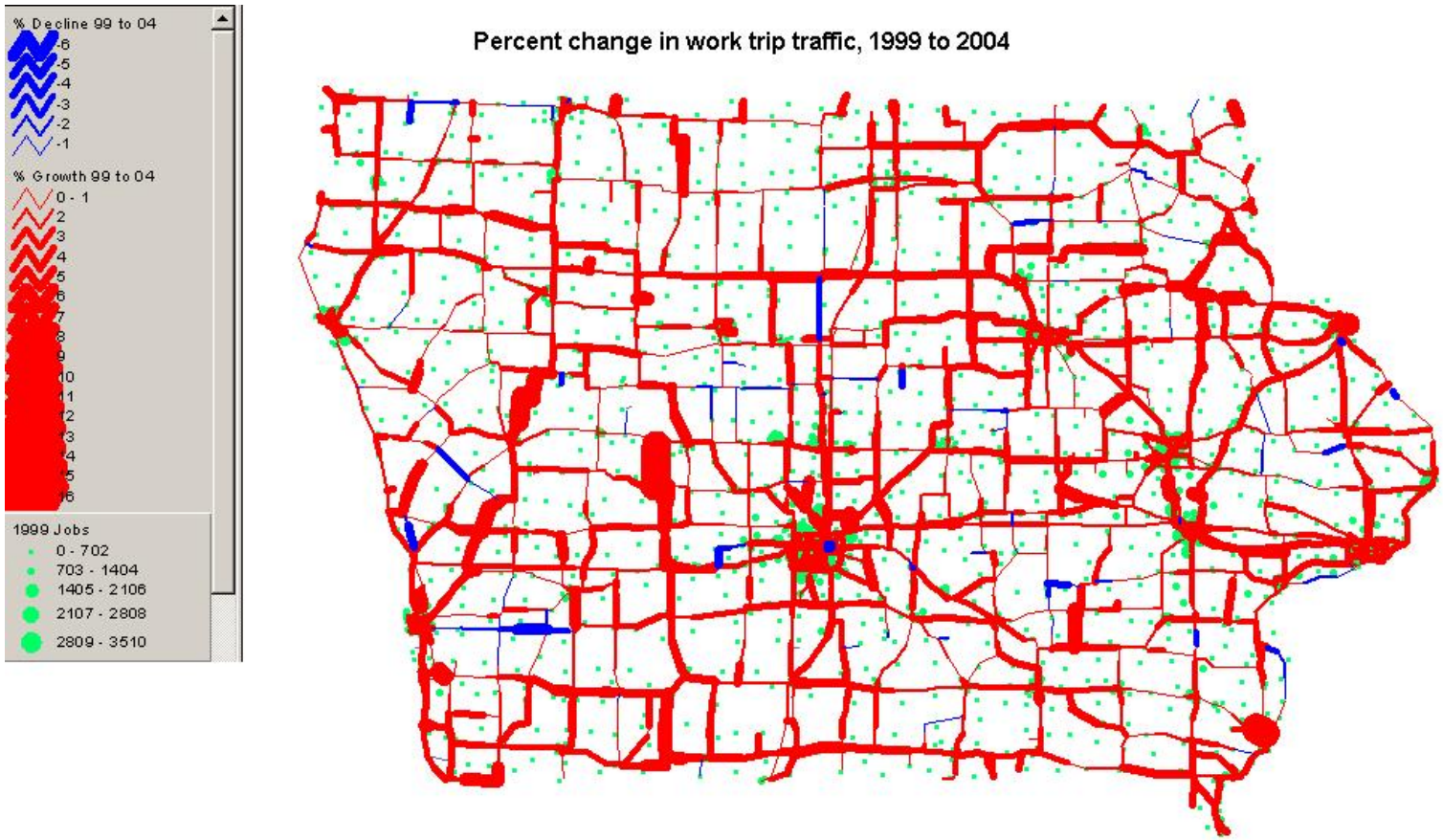
2004 Estimated Traffic Model Commuting Trip Volume



Forecast Absolute Change In Commuting, 1999-2004



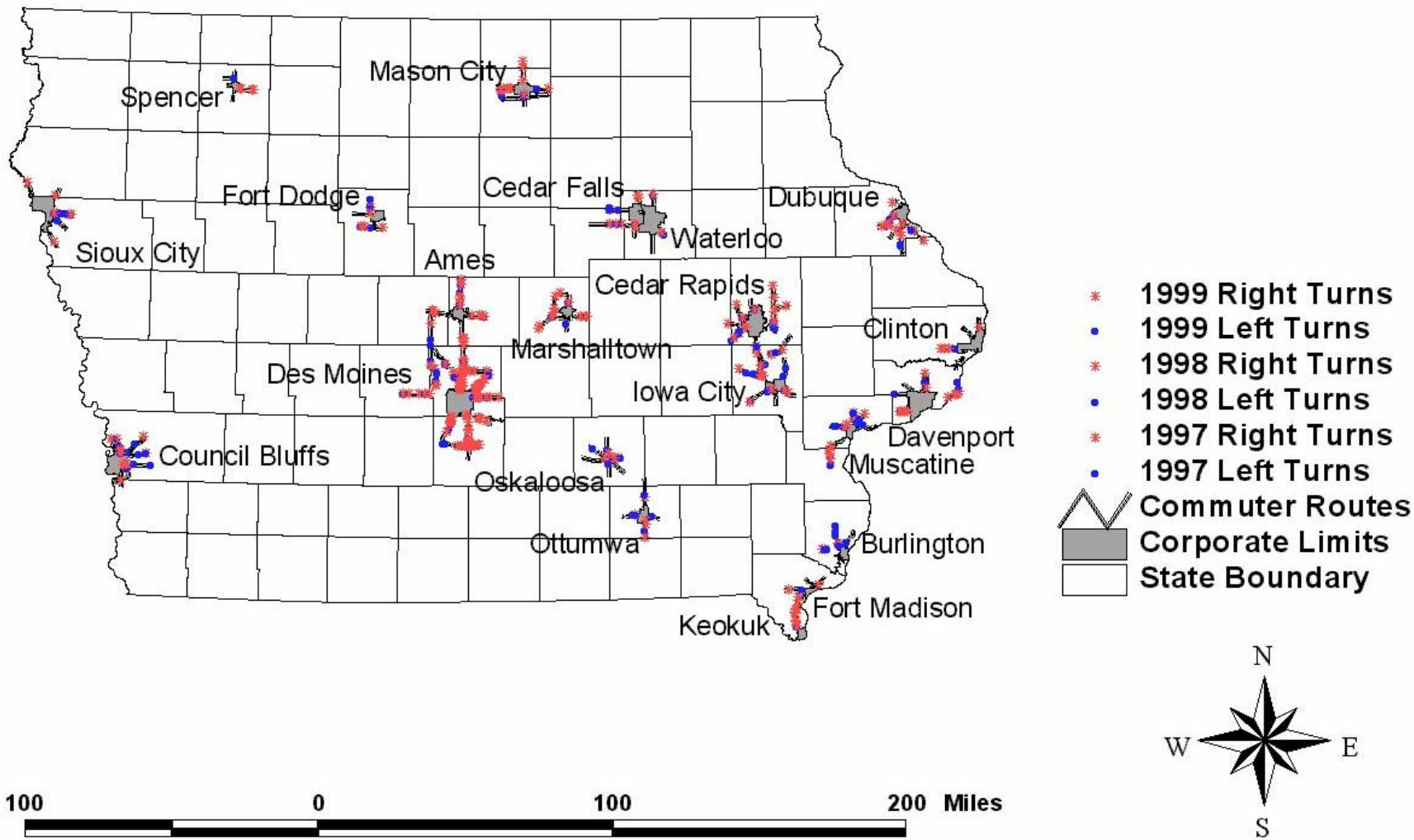
Forecast Percentage Change In Commuting, 1999-2004



Access-Related Crashes Included In Analysis

Collision Type	Description
4	Rear-end/right-turn collision
5	Rear-end/left-turn collision
12	Broadside/right-angle collision
13	Broadside/right-entering collision
14	Broadside/left-entering collision

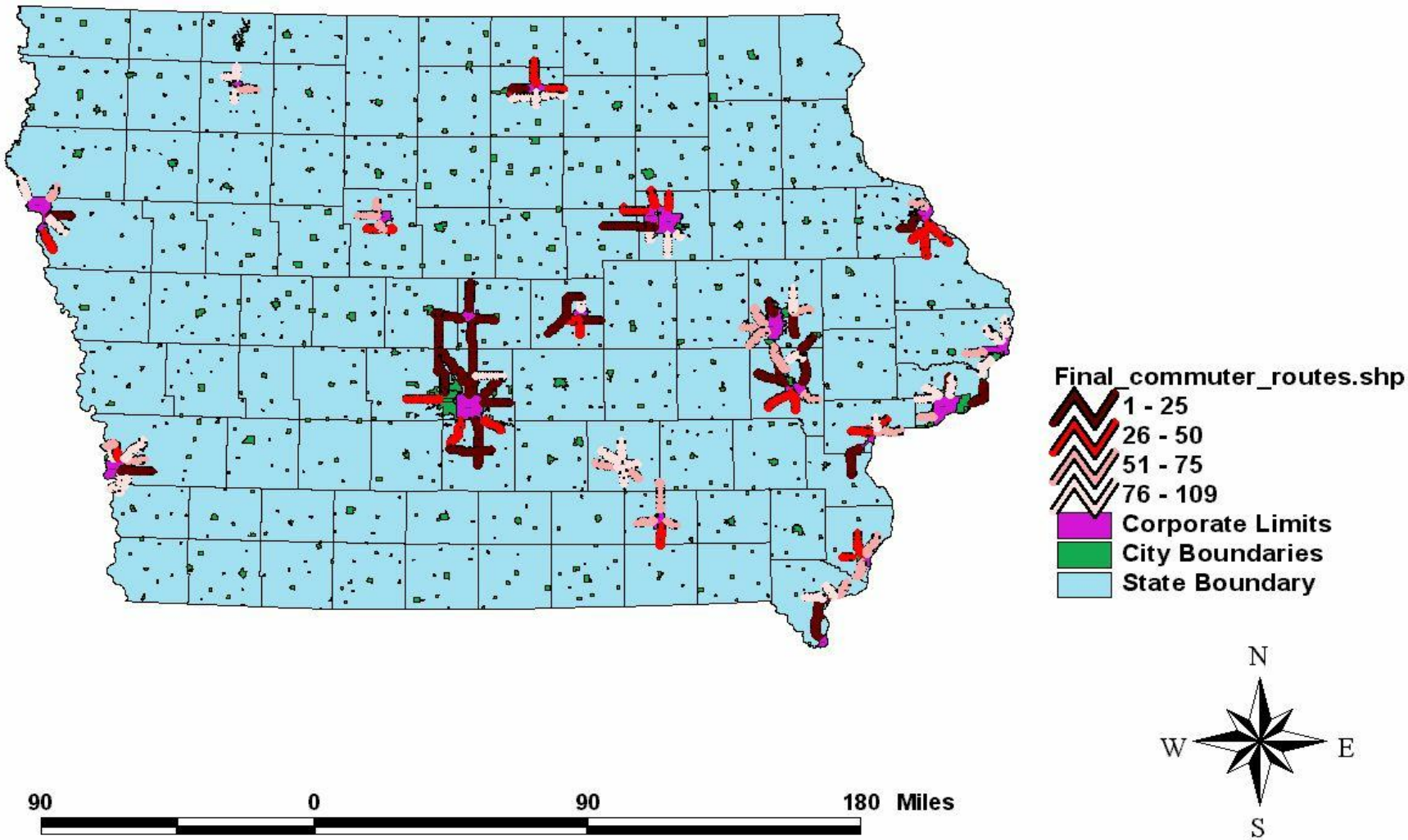
Iowa Commuter Routes: Access-Related Crashes



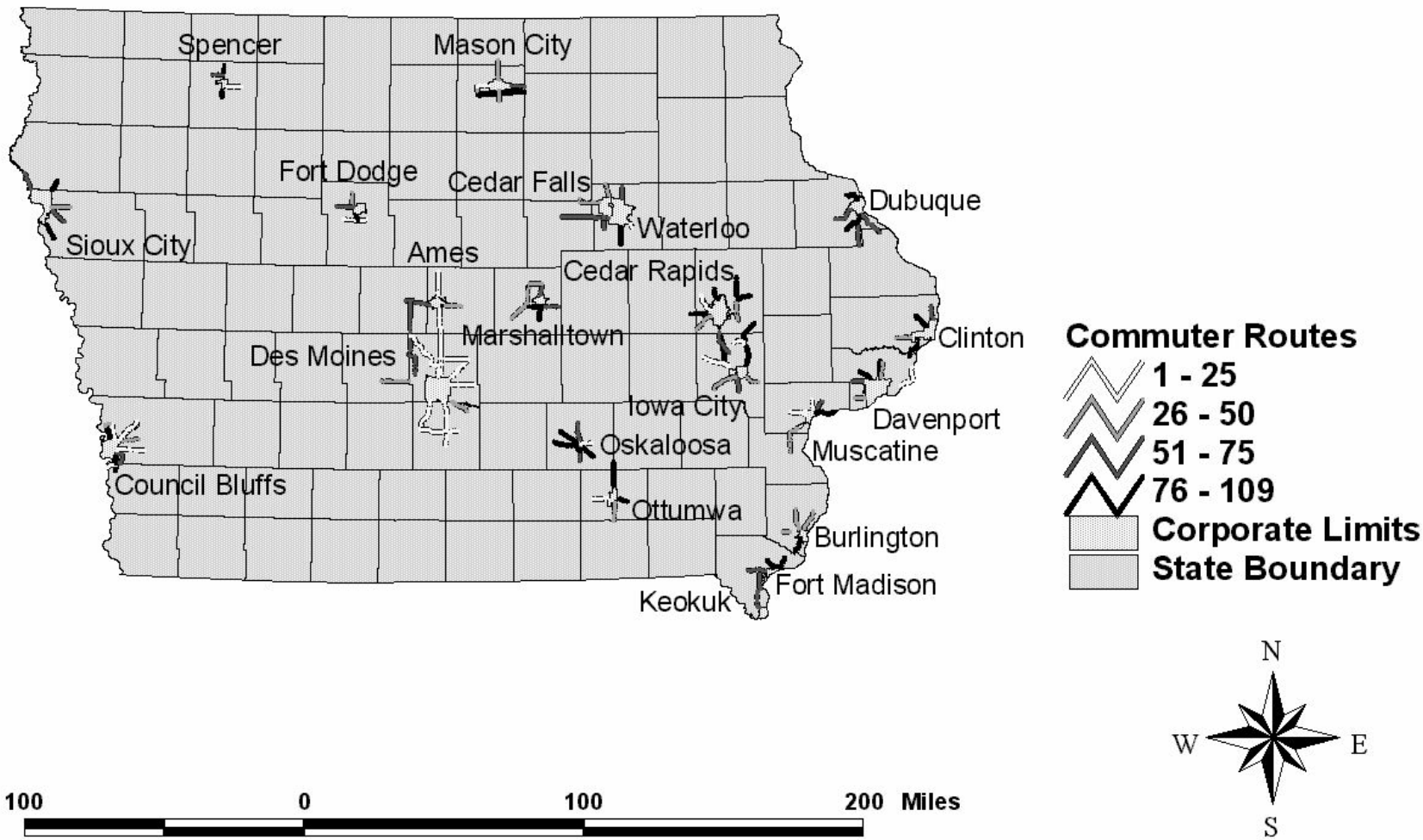
Ranking Factors Used

- **Frequency**—This indicator represents the number of crashes that appear to be access related, in particular those that involve turning vehicles. All turning crashes were included, whether they occurred at private driveways or public road intersections.
- **Rate**—This indicator is the frequency of access-related crashes per million vehicle miles traveled (VMT).
- **Loss/severity**—This indicator measures the estimated cost of access-related crashes in dollars, including an estimate of the cost of fatalities, personal injuries, and property damage.
- **Percentage access related**—This indicator represents the percentage of total crashes that appear to be access related.

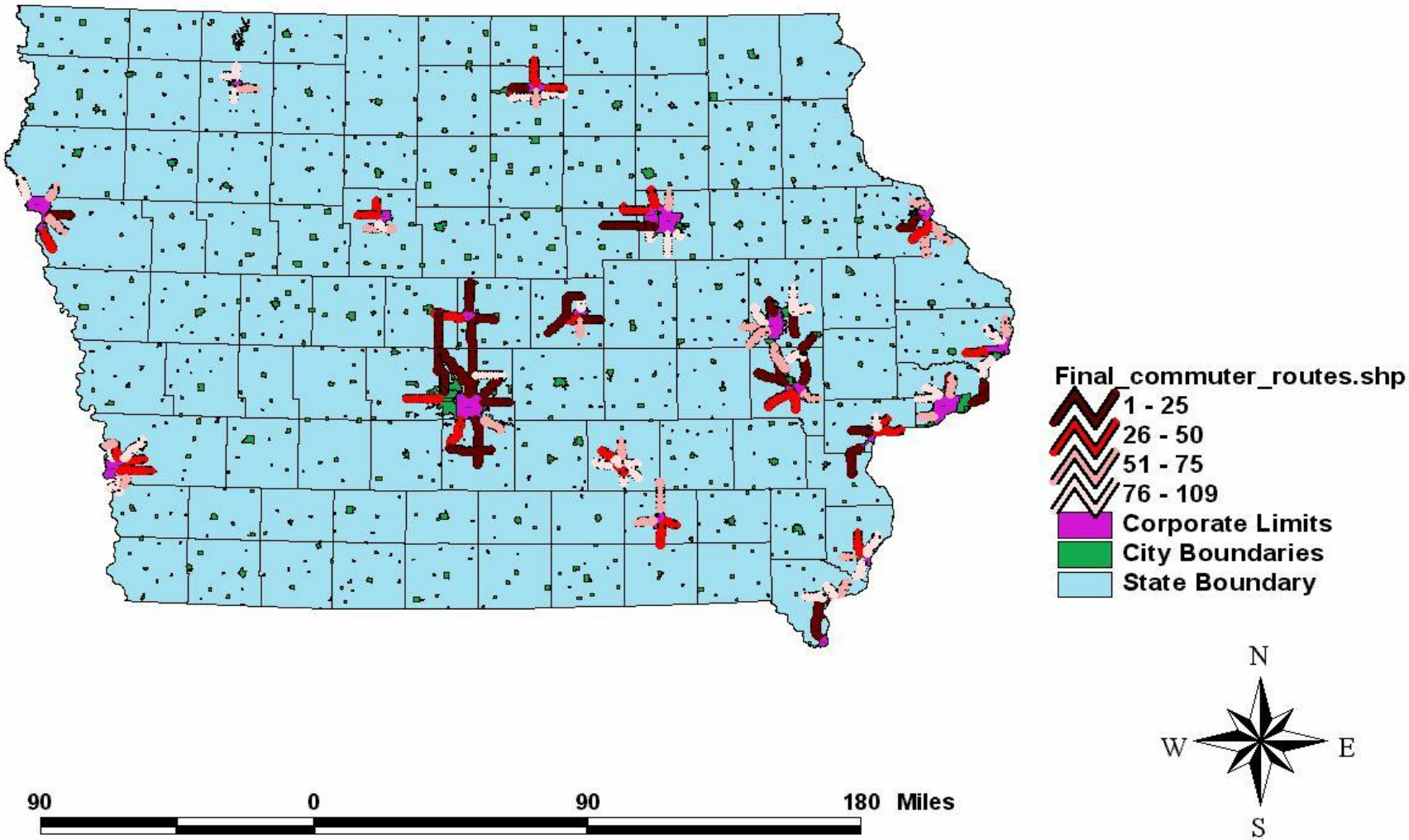
Iowa Commuter Routes: Frequency Rankings



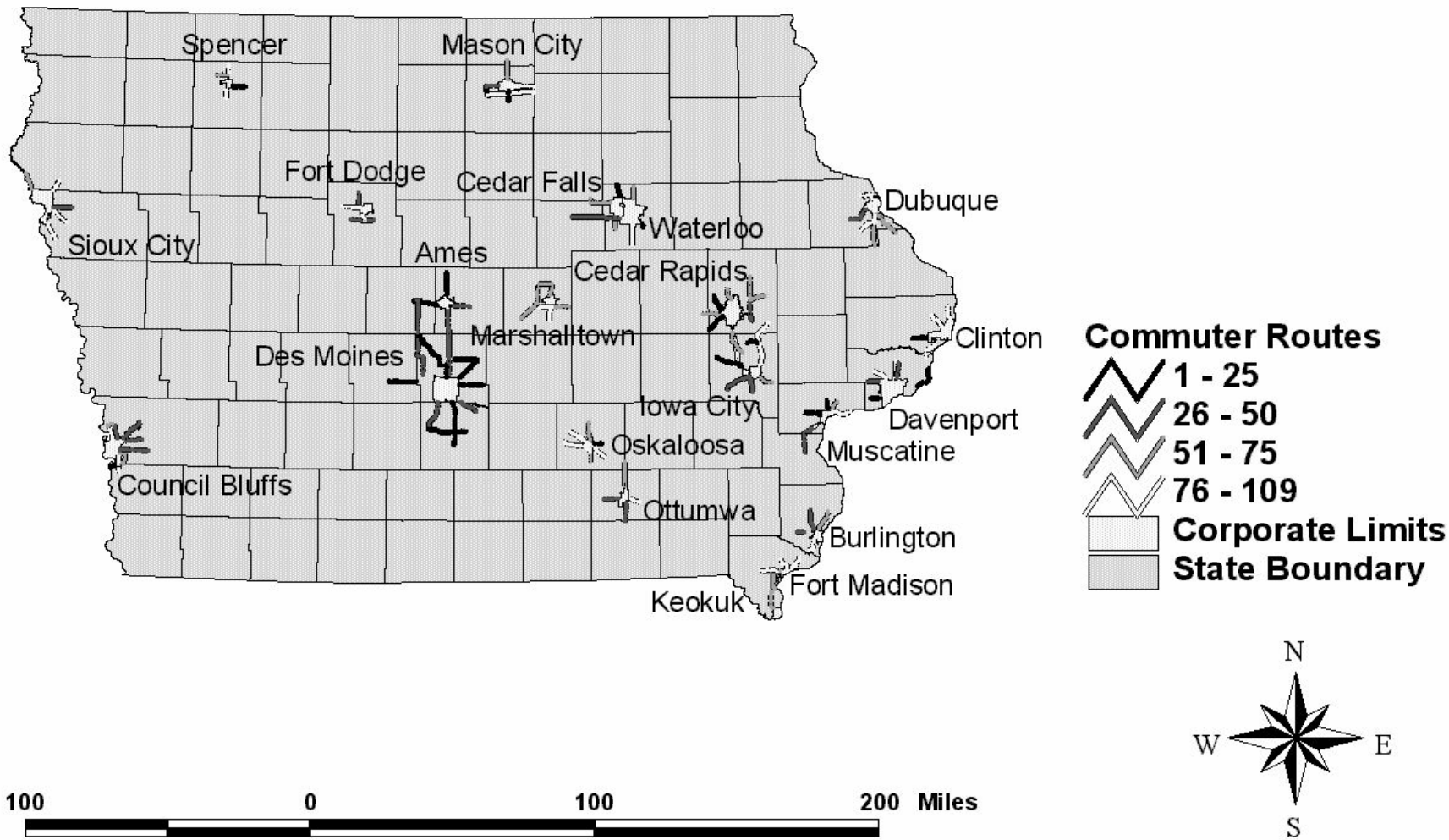
Ranked Commuter Routes by Access-Related Crash Rate



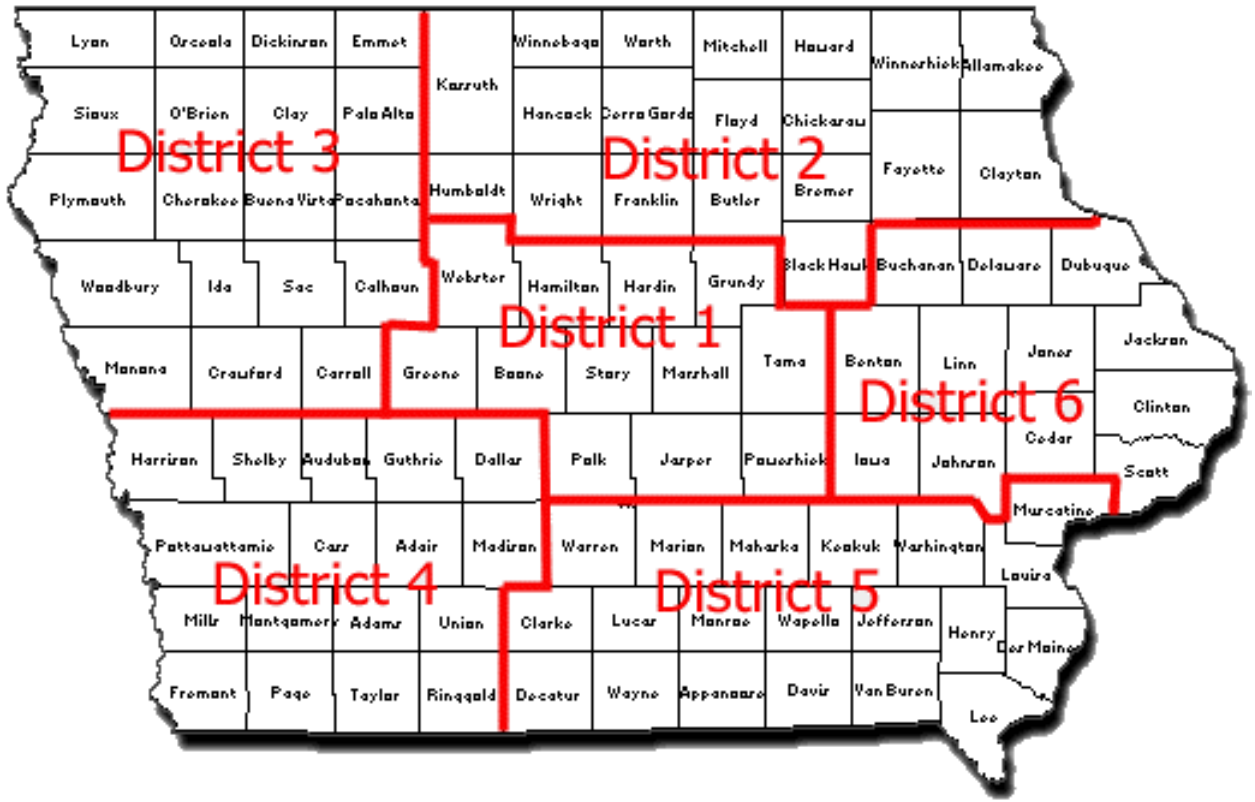
Iowa Commuter Routes: Loss Rankings



Ranked Commuter Routes by Percentage of Access-Related Crashes



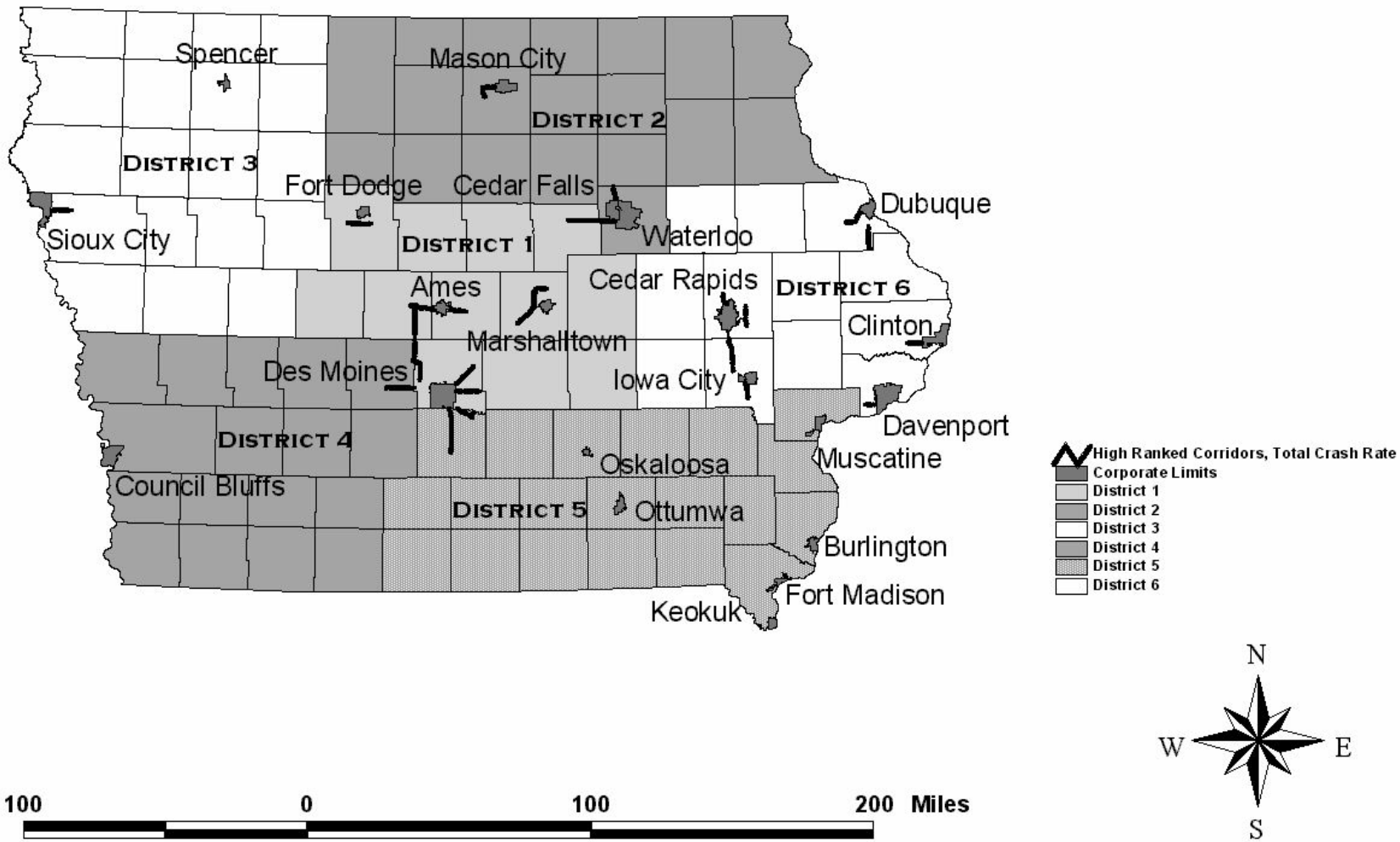
Iowa DOT Districts



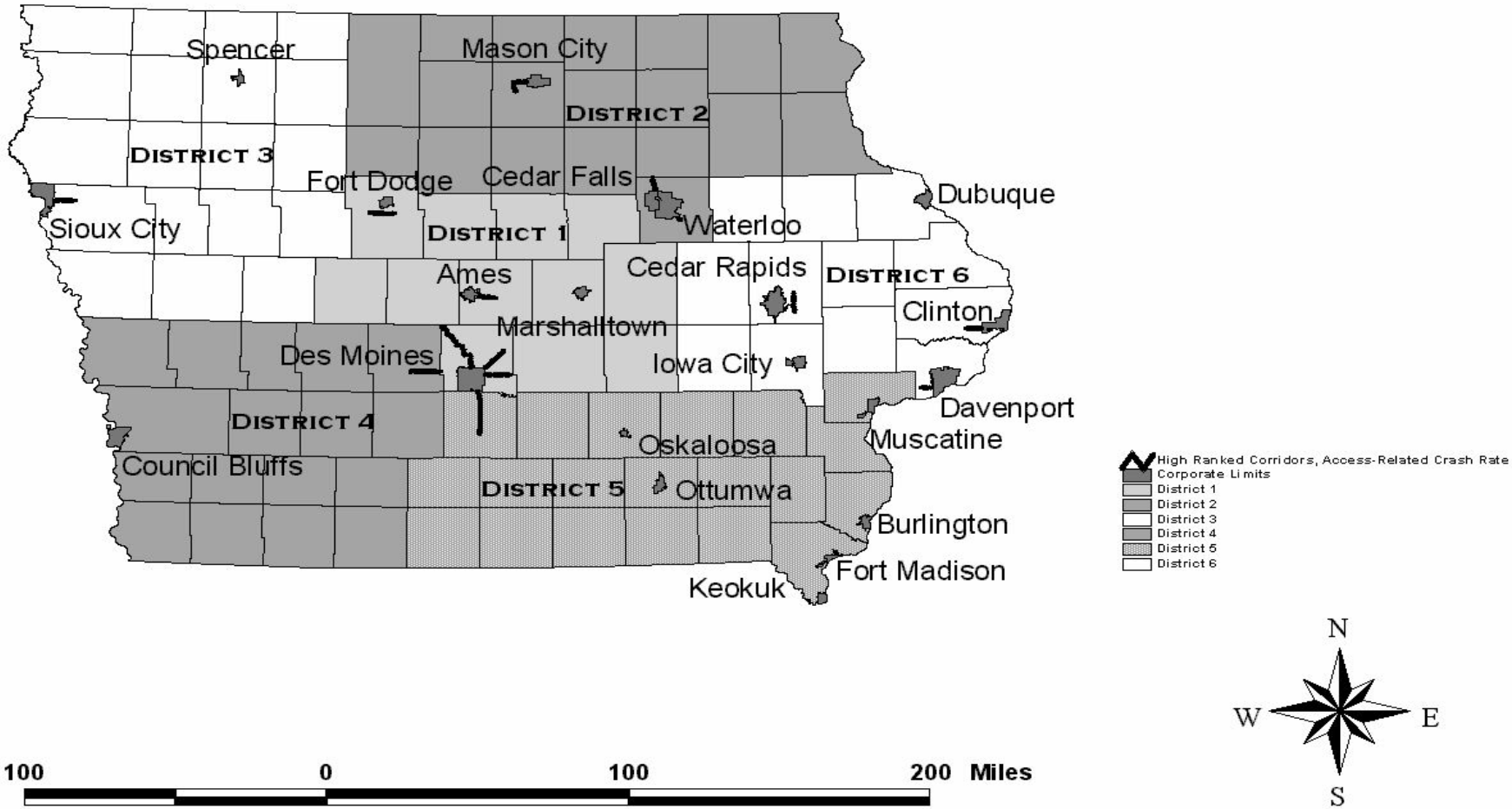
Access-Related Crash Losses On Commuter Routes By Iowa DOT District

District	Loss from Total Crashes	Loss from Access Crashes	Percentage of Access Crash Loss to Total Crash Loss	Percentage of District Access Crash Loss to Total Access Crash Loss
1	$19,266,493,500	$4,132,017,500	21.45%	54.52%
5	$9,171,777,500	$1,698,090,000	18.51%	22.41%
6	$5,818,520,000	$828,232,500	14.23%	10.93%
2	$1,856,240,000	$487,407,500	26.26%	6.43%
4	$1,374,847,500	$352,772,500	25.66%	4.65%
3	$752,072,500	$79,925,000	10.63%	1.05%
Total	$38,239,951,000	$7,578,445,000	20.00%	100.00%

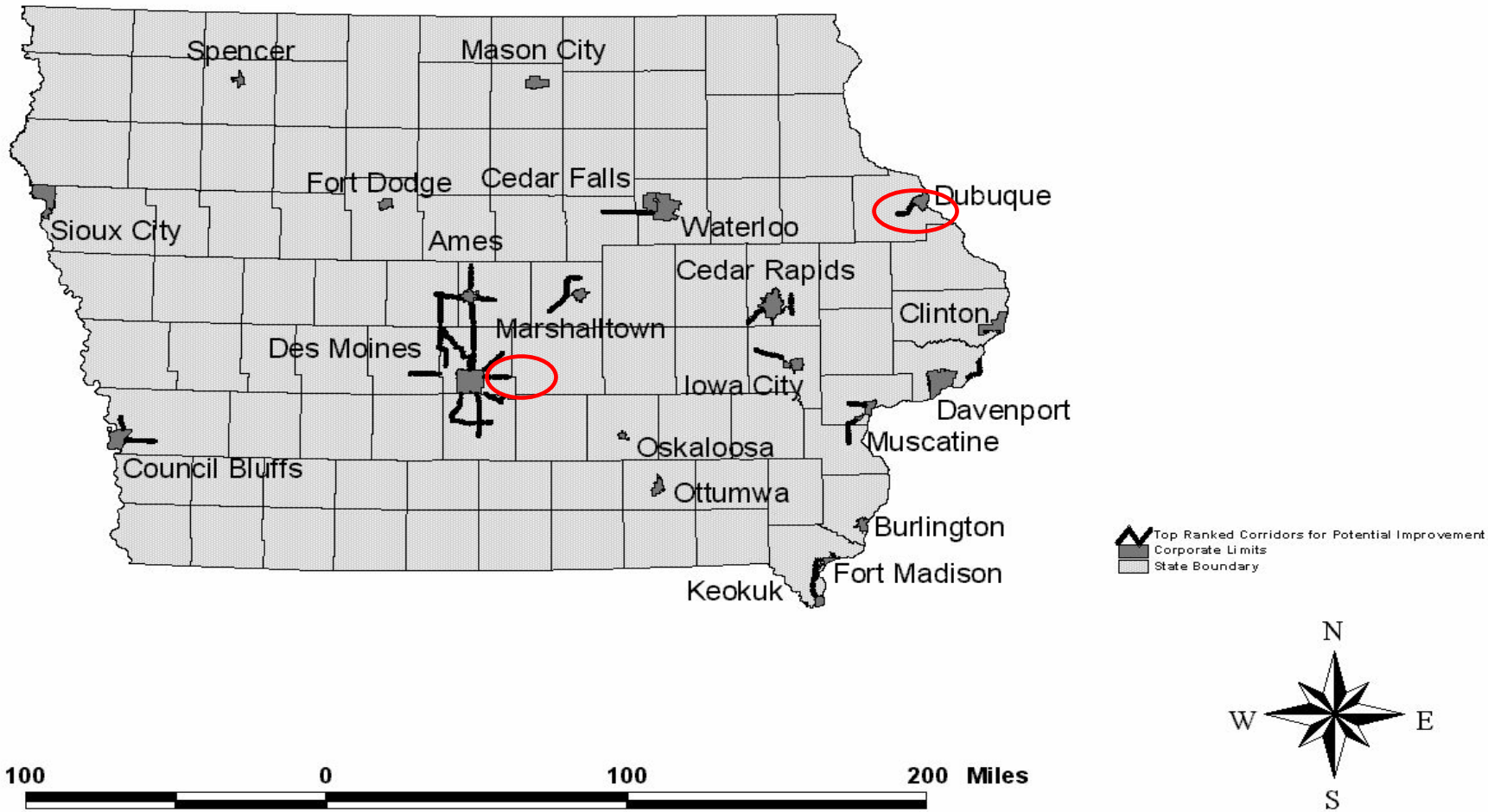
Highest Ranking Four-Lane Or Partial Four-Lane Corridors, Total Crash Rates



Highest Ranking Four-Lane Or Partial Four-Lane Corridors, Access-Related Crash Rates



Iowa Commuter Routes:
Top Ranked Corridors for Potential Improvement

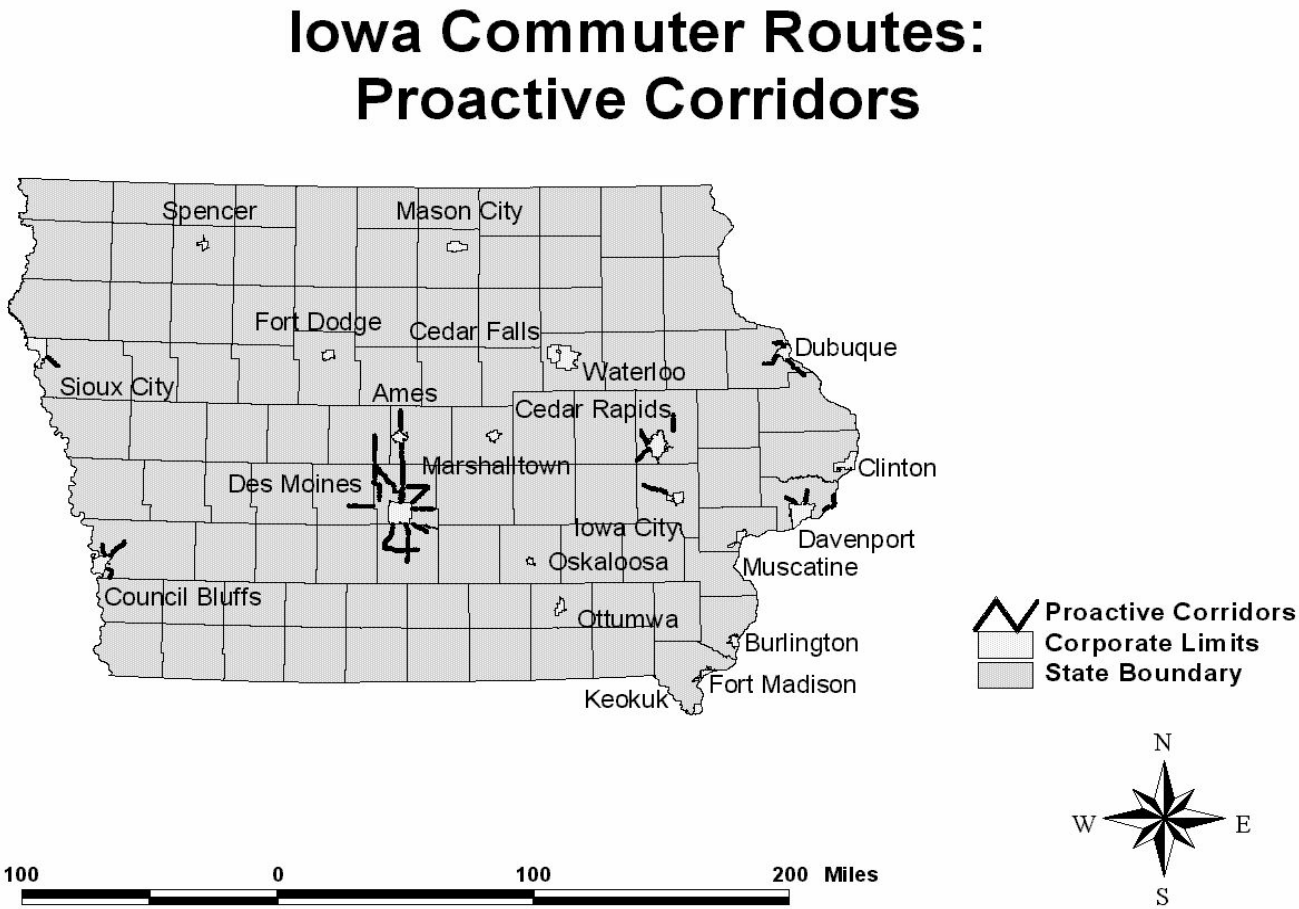


Red circles indicate pilot projects

“Pro-Active Corridors”

- Some corridors may not have access-related crash problems today, but could have in the future
- “Pro-Active Corridors” were identified based on the following factors:
  - Forecast commuting traffic growth
  - Proximity to metro and large urban areas
  - Access priority ranking of 3, 4, 5, 6, or none
  - Driveway access density

Pro-Active Corridors: Most Likely Future Access Issues



Most Access Management Problems Happen Incrementally

- Poorly managed corridors don't happen overnight; they happen over many years
- They often happen one decision at a time
- A series of decisions is usually involved in degrading a corridor
  - What can one more median opening hurt?
    - One more commercial driveway?
    - One more traffic signal?
  - The problem is that all the small, bad decisions cumulate into one large problem—a "hairball", to use computer programming slang

Next Steps: Corridor Management Pilot Projects

- Start with a small set of corridors that rank high in terms of access problems and where improvement is possible
- Develop model access management corridor analysis tools, plans and agreements
  - There was such an effort underway on US 6 in District 4 already
  - New pilot projects were added along US 20 and IA 163 (Districts 6 and 1)
  - The corridor plan will be a “vision” for how the corridor will look in the future, signed off on by both the Iowa DOT and local governments

Some Critical Access Management Standards For Commuter Routes

- Clearance of functional areas of interchanges and intersections
- Public road density and traffic signal spacing
- Median breaks
- *Commercial* driveway density and spacing
  - Residential and farm field entrances are less critical unless you expect land use change
- Driveway sight distance
  - This is the major issue on many two-lane rural arterials

Think and Manage Beyond the ROW Line On The Mainline

- Many of the best access management solutions involve making changes to site plans for new developments and redesign of existing developments
- Some of these solutions include improved internal circulation, parking lot interconnection, cross-access, joint access, and alternative access roads (e.g. backage roads)

Coordinate Access Management and Land Use Planning

- Transportation agencies have authority over traffic signals, interchanges, intersections, medians, and driveway entrances
- They *do not* have authority over land use plans, zoning, and subdivision designs or platting
- Staff who manage driveways and other access features need to consult with local land use planners on an ongoing basis (and visa versa)

Practice Corridor Management Thinking

- Transportation corridors are valuable assets that can be diminished in value through a series of poor access decisions
  - Think of poorly managed access as extra depreciation
- The value of corridors can be preserved through access management
- The end result of poor access management is often a very expensive bypass combined with a remaining arterial that still doesn’t function very well

Presentation Recap

- Current Iowa DOT access classes and map
- Research project goals
- Research methodology
- Key ranking results
- “Proactive corridor” identification process
- “Proactive corridor results”
- Next steps: thinking about corridor management

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